Use of zinc sulfate

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TO ALL SHIPPERS:

The following information on brown rot control, with reference particularly to the use of zinc sulphate, has been prepared by Professors H. S. Fawcett and H. J. Quayle, of the Divisions of Plant Pathology and Entomology, Citrus Experiment Station, Riverside, California.

RSW:V

R. S. WOGLUM,
Entomologist.

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PREVENTION OF BROWN ROT OF CITRUS

"A great deal of interest has developed in the question of a possible substitute for Bordeaux mixture in the control of brown rot. This interest is due mainly to the fact that the copper spray, though efficient for brown rot control, renders the trees more susceptible to injury from cyanide fumigation. There is indication that in orchards where the ground and lower branches, up to 3 feet from the soil, have been sprayed with Bordeaux mixture every year for a number of years, the copper content builds up so that the trees become more and more susceptible to fumigation injury. The usual practice in the past has been to use a Bordeaux spray of about the formula 3 pounds of copper sulphate, 3 pounds of lime to 50 gallons of water. Some growers have preferred a 4-4-50 mixture. Where fumigation with cyanide is not used for pest control, this may still be used as an efficient preventive.

"The results of one season's experiments with zinc sulphate lime spray indicate that considerable control of brown rot may be obtained, provided the zinc is in sufficient quantities. The zinc spray has shown no effect in increasing injury from fumigation. The following suggestions are based on this one year's experience. The zinc spray may be made from several different original materials and the zinc content be the same.

"1. Use 8 pounds of zinc sulphate, 4 pounds of fresh hydrated lime to 50 gallons of water. This formula is based on a zinc sulphate with 7 molecules of water or, chemically stated, $ZnSO_4 \div 7H_2O$, which has 22.7 per cent of zinc. There are other forms of commercial zinc sulphate on the market with different percentages of zinc. For example, one commercial lot contained 24.5 per cent zinc, and would therefore require 7.4 pounds to equal the 8 pounds above. Another contained 33.7 per cent zinc and would require only 5.4 pounds to equal the 8 pounds above.

"2. A zinc lime powder already prepared may be obtained on the market. In this the lime has already been combined with the zinc sulphate. If this contains 20 per cent of zinc, 9 pounds of the powder to every 50 gallons, or 54 pounds to a 300-gallon tank, is equivalent in zinc content to the 8-4-50 formula mentioned above. If the percentage of zinc in the powder is not 20 per cent, then the amount required can be calculated accordingly.

"3. The zinc sulphate is also available on the market in another form, already dissolved in water at the rate of 7.2 pounds of $ZnSO_4 \div 7H_2O$ to each gallon of water. With material of this strength it takes about 6 2/3 gallons of the solution for each 300-gallon tank of spray.

"For brown rot alone, the ground and lower branches should be thoroughly sprayed. The spray may also be used all over the tree if desired, without making the tree susceptible to fumigation injury, and this is suggested for young trees or trees suffering from mottle leaf. The trunks may also be drenched with the spray as a partial protection from bark infections.

"Although the zinc spray may be a little less efficient for brown rot control than the copper spray, the safety of the zinc in case of fumigation and its possible benefit for preventing mottle leaf may make it more desirable in many cases. Most growers would prefer to take a little more loss from brown rot in order to avoid danger from increased fumigation injury."